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## 2022 Proceedings of the France/Finland conference on the circular economy

Mathieu Leporini, Kari Herlevi, Susanna Lehvävirta, Emma Kari, Agnès Cukierman, Petri Peltonen, Anne Kaiser, Mira Jarkko, Saara Alakorva, Teemu Loikkanen, et al.

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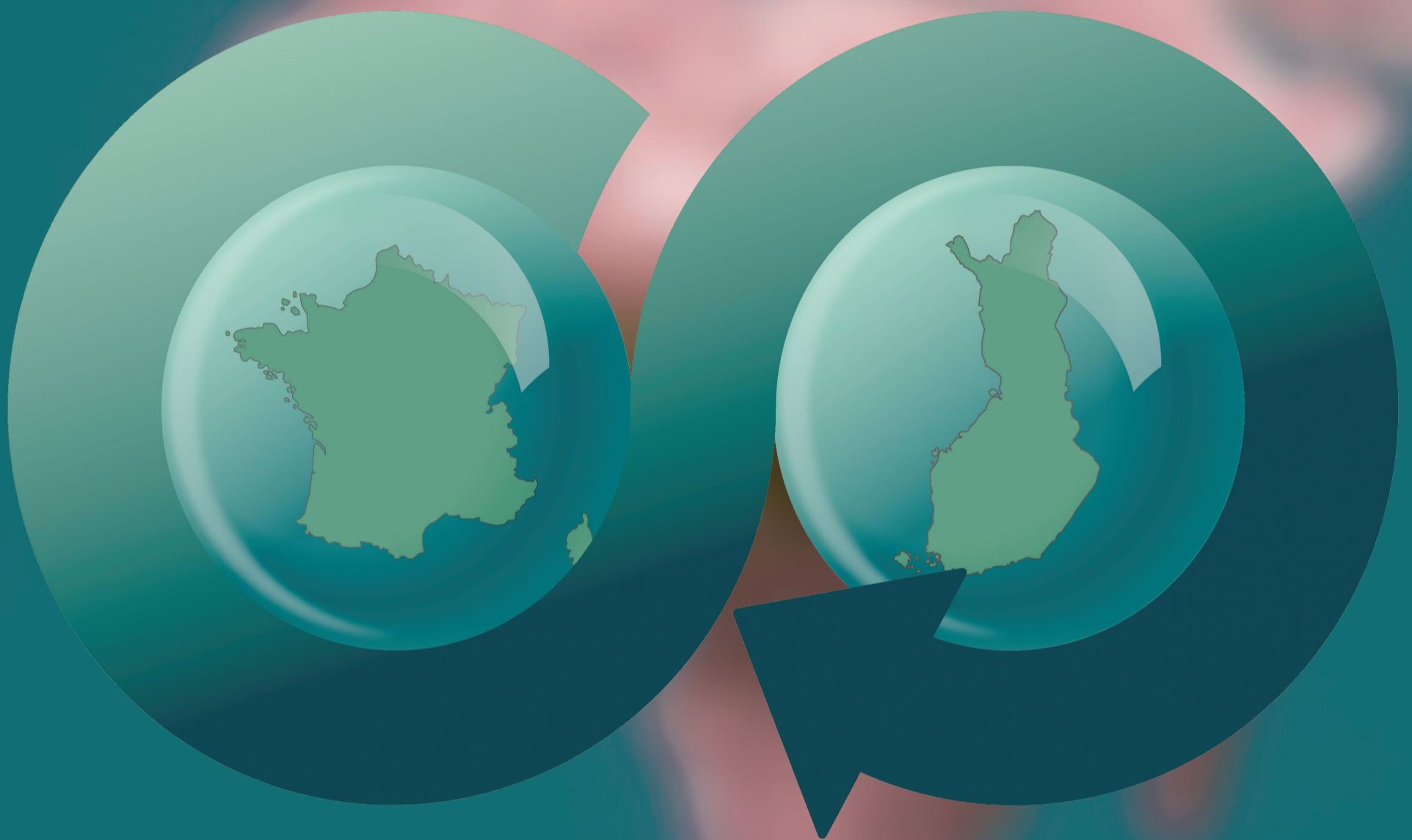
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Proceedings of the  
**FRANCE-FINLAND**  
CONFERENCE  
on the circular economy



held on Tuesday, May the 17th 2022  
at Eurooppasali

Malminkatu 16 00100 HELSINKI

# The

# FRANCE-FINLAND

# CONFERENCE

## on the circular economy

## Programme

### 15.00 Introduction (15 min)

- Welcoming words from **Agnès Cukierman**, Ambassador of France to Finland
- Welcoming words from **Emma Kari**, Minister of the Environment and Climate Change of Finland
- Welcoming words from **Petri Peltonen**, Under-Secretary of State, Ministry of Economic Affairs and Employment of Finland

### 15.15 Keynote (20 min):

- **Mathieu Leporini**: From a circular economy to a circular society: a holistic approach towards a resilient and sustainable economy

### 15.35 Panel discussion (10 min each + 30min)

- **Kari Herlevi**, Director, Circular Economy for Biodiversity – The Finnish Innovation Fund Sitra
- **Susanna Lehvävirta**, Research Director, Helsinki Institute of Sustainability Science - University of Helsinki
- **Anne Kaiser**, Sustainability Manager – Saint-Gobain Finland Oy
- **Mira Jarkko**, Project manager, Cluster programme for Circular Economy – City of Helsinki
- **Saara Alakorva** and **Teemu Loikkanen**, Researchers - University of Lapland
- **Petrus Kautto**, Director, Programme for Sustainable Circular Economy - Finnish Environment Institute Syke
- **Mathieu Leporini**, Researcher, European Center of Excellence on Sustainability  
Moderator: **Johanna Kohl**, Director, Circular Bioeconomy Research Programme - Natural Resources Institute Finland Luke

### 17.10 Closing remarks

# Agnès Cukierman

*Ambassador of France to Finland*

Agnès Cukierman has been Ambassador of France to Finland since 2020. For over 35 years, she has been working for the French Ministry of Foreign Affairs where she has occupied different positions. Before being an Ambassador, she was the chief financial officer after being a Senior Auditor of the French General Inspectorate of Foreign Affairs and a First Deputy Budget Director. Previously, she was Head of Unit in the Human Resource Department. Agnès Cukierman also worked twice as a diplomat at the French Embassy in Moscow and in different political Departments in Paris.



## **Introduction - Welcoming words**

### **• Welcoming words from Agnès Cukierman, Ambassador of France to Finland**

Dear Mr Petri Peltonen, Under-Secretary of State at the Ministry of Economic Affairs and Employment

Dear representatives of the scientific community, of the civil society and of the industry

I am very pleased to welcome all of you today at the European Commission representation in Finland for this 2022 edition of the France Finland Conference on Circular Economy.

I am also very glad that this event is co-organized, as in 2018, with the Finnish fund for innovation Sitra, which is one of the main Finnish actors in this domain.

In March 2020, the European Commission adopted the new circular economy action plan (CEAP). It is one of the main building blocks of the European Green Deal. The EU's transition to a circular economy is aiming at reducing pressure on natural resources and creating sustainable growth and jobs. It is also a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss.

In 2020 France shaped a system-wide transition towards a circular economy with an ambitious Anti-waste law that has introduced several measures that are a world first:

- first country to ban the destruction of unsold non-food products. Companies will now have to reuse, donate or recycle their unsold products.
- first country to introduce a mandatory repairability index on electronic and electric products to increase the proportion of products that get repaired. It leads manufacturers to consider repairability at the design stage and increases consumers awareness.
- The law also aims to stimulate societal transformation, by creating new jobs and supporting the solidarity economy.

This Anti-waste law is quite successful, and France has been chosen by foreign investors to deploy their circular economy activities. The American company Eastman will build «the world's largest molecular plastics recycling plant» in order to develop the circular

economy. Quebec-based Loop is partnering with Suez to develop plastic recycling projects and Ikea has announced an investment of over €650 million for circular economy and sustainable transport projects in France. France wants to become exemplary in this field with the ambition to recycle 100% of plastic by 2025 and the demand for recycled plastic has now become greater which makes circular economy even more attractive.

Finland also actively contributes to the dissemination of circular economy concepts and has taken, in 2021, the resolution to promote circular economy, based on a vision that in 2035 the Finnish economy will be based on a carbon-neutral circular economy society.

Today we have the chance of welcoming a very diverse and rich panel of experts who will share their expertise and experience with us and discuss how the circular economy can, should or will take hold in all areas of our society.

I would like to thank all our speakers who accepted to participate in this event. I also would like to thank the Innovation Fund Sitra for organizing this event with us and finally, thank you to the European Commission representation in Finland for hosting us today. I wish you all very fruitful discussions.

## Emma Kari

*Minister of the Environment and Climate Change of Finland*

Emma Kari is the acting Minister of the Environment and Climate Change in the Finnish government. She is also a Member of the Finnish Parliament since 2005 for her second term and Member of the Helsinki City Council since 2009. She acted as the Chair of the Finnish Greens Parliament Group prior to her selection as the Minister of the Environment and Climate Change. She has also worked as a Special Advisor in the Ministry of the Environment and Climate Change in 2014 prior to her selection to the Finnish Parliament.



### **Welcoming words from Emma Kari, Minister of the Environment and Climate Change of Finland**

Dear friends - your excellences,

Circular economy is the model of the future. For Europe and for the world.

There are several reasons why we need to make this shift.

**First** - Natural resources fuel our production and consumption. Globally, the use of natural resources has more than tripled in 50 years. It's time to change our production and consumption habits.

**Second** - the green transition will trigger a new race for natural resources. Windmills, electric cars and hydrogen solutions require more materials and low carbon electricity.

**Third** - the use of natural resources has immense impacts. Half of the greenhouse gas emissions and more than 90 per cent of biodiversity loss come from the consumption of resources.

**Last** – the horrible Russian invasion of Ukraine has revealed that we need to increase our self-sufficiency and reduce our dependence on global material flows.

There is not just one single solution to respond to these challenges. Transition to circular economy is not just about businesses, but we need to make a change in the whole society and the way we plan and design our policies, cities and infrastructure. France has been a prime example in being forward-looking and innovative in creating legislation and markets for a more circular economy. France has for example introduced product footprint methodology and Repairability Index for electronic devices. The EU-commission and we in other countries have been following carefully your experiences. In Finland, we have set a target to become carbon neutral by 2035. Last year the government made a decision – I would say a historical decision - to curb the overconsumption of natural resources.

Now we are in a process to make this happen. Ministries, businesses and cities together have started to plan circular economy together with researchers.

The outcome of this dialogue based on solid scientific work will eventually be concrete and effective measures and policy tools to create a positive circle to reach sustainability targets.

I wish you all a most fruitful event and many new ideas!

## Petri Peltonen

*Under-Secretary of State, Ministry of Economic Affairs and Employment of Finland*

Petri Peltonen is Under-Secretary of State at the Ministry of Economic Affairs and Employment. In this capacity, he oversees policy development and implementation in the sectors of industry, enterprise and innovation as well as foreign direct investments.

Prior to taking his current position in 2016, Petri Peltonen was Director

General of the Enterprise and Innovation Department at the Ministry of Economic Affairs and Employment and the Technology Department at the Ministry of Trade and Industry.

From 1996 to 2006, he worked at the Finnish Funding Agency for Innovation (Tekes), most recently as Executive Director and member of the management team. From 1987 until 1996, he held several technology development positions at the European Space Agency (ESA) in the Netherlands and in the electronics industry in Finland.

Within the scope of his duties, Petri Peltonen takes part in several national and European functions such as the boards of Business Finland, Finnish Innovation Fund (Sitra) and the Nordic Investment Bank. He also acts as the European Commission's SME Envoy for Finland. Petri Peltonen holds M.Sc. and Lic.Tech. degrees from Tampere University of Technology. He is an invited member of the Finnish Academy of Technical Sciences.



## **Welcoming words from Petri Peltonen, Under-Secretary of State, Ministry of Economic Affairs and Employment of Finland**

Well thank you very much, Ambassadors, ministers on the screen, beautiful dear participants here locally and I'm sure there's quite another of you following the event online. Welcome to all and let me first really joining (address?) thanks especially towards the French embassy here for organizing that event with SITRA our so dear think tank especially in the Circular economy.

In many ways of course this is more than topical theme. I know this is very strongly also in the French presidency agenda so in that sense we're delighted to see that we have sort of a common thinking, shared objectives between Finland and France when it comes down to European policymaking and really seeing the opportunity of circular economy in a very broad sense as truly a European competitive advantage, really being able to pursue our ambitious climate policies in Europe. Finland being really one of the four front countries in the by aiming to reach carbon neutral as we know about 2035 Europe climbs through 15 years later in a broader sense. I think it's an area where circularity certainly has a significant sort of opportunity.

I'll just sort of try to underline one specific Finnish dimension. First of all, of course one can argue that Finland was, before the words bio circularity and bio economy were invented, we were basically doing that already so in that sense it comes reasonably naturally for Finland to sort of think along those lines. From the Finnish perspective or in many ways our sort of circular thinking is based on renewable resources. There's smart sustainable sort of value-adding use it's the Finnish model in particular when it comes down to circularity and of course especially on bio-based solutions. I would like to also underline that even though bioeconomy is quite often sort of considered of you know the northern countries Finland, Sweden and the other foresters' countries are the bioeconomic countries but that's not true. Actually, each and every European country certainly is a bioeconomy. Let's take Portugal for example oceans sort of nation and in that sense truly very much in the circularity theme and bioeconomy theme, there we take the Netherlands or many others that seems I think we should recognize both circularity and bioeconomy as really important policy tools and opportunities to advance our climate objectives for example that in these themes. It's something where we appreciate the French presidency in that sense that you've been pushing these agendas and really enabling them to become clearly European sort of policy solutions.

So, with this, ladies, and gentlemen I'm certainly looking forward to joining the audience and really listening to the panel discussion and especially our sort of keynote presentations really to share us new ideas new inspiration and of course looking at a lively debate on the great opportunity of circularity and especially the bio-based solutions there. Thank you very much.

# Mathieu Leporini

*Researcher, European Center of Excellence on Sustainability  
CERDI (CNRS/Clermont Auvergne University)*



Mathieu Leporini holds a PhD in Atmospheric Sciences and began his career at the CNRS where he worked on European research projects related to climate change. He worked as the Director of the European and International Affairs for Research of Clermont University and Avignon University. From 2012, he was the Resident Advisor for the European Union Delegation in Morocco. He was then a scientific diplomat for the French Ministry of Europe and Foreign Affairs in Vancouver, Canada and in Helsinki, Finland, where he notably contributed to the bilateral cooperation on the topic of circular economy. Back in France, he was the Director of the South of France Regional Research Centre of INRAE and was responsible for missions at the national level related to international mobility strategies and sustainable development. Working within Erasme, the European Jean Monnet Centre of Excellence on Sustainability, he is working and developing international, interdisciplinary and intersectorial research projects around several topics: Theory of Circularity, Complexity, Systemic approaches, Circular Economy, Sustainability Science, Circular Cooperation and Indigenous, Traditional and Local Knowledge.

## **Keynote - Mathieu Leporini : From a circular economy to a circular society: a holistic approach towards a resilient and sustainable economy**

Madame l'Ambassadrice, Your Excellencies,  
Dear Minister, Under-Secretary of States,  
Des Colleagues and friends,

First, I would like to deeply thank Sonia Couprie, Science and University Cooperation, of the Embassy of France at the Institut Français in Helsinki and the teams from the French Institute and Embassy, and Sitra for co-organizing this public event today together with my research institution: The European Centre of Excellence on Sustainability hosted at the CNRS research unit CERDI at Clermont University. It is a great pleasure for me to be here today, especially after have spent many times working here, a great pleasure to come back and meet again with Finnish friends and partners after the many crises we are still going through.

Meeting the other, finding and creating space for dialogue so that we can understand and acknowledge her or his life journey and expectations with an intention of cooperation to foster the process of innovation, co-creation, to embark on a resilient path at all levels, in all systems, is at the core of my research and development activities.

For this keynote "From a circular economy to a circular society: a holistic approach towards a resilient and sustainable economy", I would like to take a step back and



try to share with you some global and holistic views that are, from my perspective, important, not exhaustive, but important, if we would like to change our paradigm on how we could make space for a resilient and sustainable society.

I will first share with you some thoughts on the State of the World and our system thinking before introducing general circularity principles of systems. We will then bring this to circular economy trying to bridge holistic approaches with indigenous knowledge. I will conclude on the topic of circular cooperation that is from my perspective at the core of this paradigm shift and possibly reshape of SDCs.

### **State of the World and Social problem**

While great improvements in human health, knowledge, and material well-being have been happening since the 19th century, our world is facing more and more global challenges with a rapidly increasing environmental degradation: multifaceted climate crises, biodiversity loss and mass extinction, planet's poisoning by toxic chemicals, highlighted by international scientific and expert communities (IPCC, IPBES, UNEP). Enhancing human well-being to more equitably meet the needs of both current and future generations is still, after so many years, an alarming concern in this period that many are now calling the Anthropocene due to dramatic human impact on nature. Indeed, the activities perpetuated by humans since the Industrial Revolution are pushing the planet outside of the range of variability and stability for many key Earth Systems and planet boundaries.

Of course, understanding what can be done today and tomorrow to collectively overcome these global challenges is important but I feel that better understanding where we are and where we are coming from, by observing our systems, ways of thinking and worldviews, may reveal complementary keys for our future.

Nowadays, most of the people are experiencing living in a disconnected world where we have lost the meaning and the experience of linkage, relationships and connection in multi-dimension. A conference at the French Académie des Sciences in 2020 was underlining that «What happens to us is the poverty of ties, that is to say that we have lost living together. (...) We feel today that we need fraternity, re-discovered communion, because happiness cannot go without otherness, and otherness, without the gift of self.»

All seems more and more fragmented, in silos, disconnected. In all sectors of our life, we are also observing a rise in power of mutual stereotypes and segmentations between “knowing/not knowing people”, which bring sometimes the principles of being “superior/inferior” and the “dominant/dominated” to life. At all levels, in all sectors, the consequences are already present. We are indeed experiencing an exhaustion of the vertical hierarchical model and a crisis of social ties.

Research and science have also resulted in very compartmented disciplines where trans- multi- inter- disciplinary research, even if more and more active, is still not very well evaluated and funded, while we actually do live in complex and interconnected adaptive systems where it's hard to study a subject without considering all connected topics, and their dynamics.

## System thinking

Maurizio Iaccarino, General Secretary of the UNESCO World Conference on Science in 2003 was saying that «Science is part of culture, and how science is done largely depends on the culture in which it is practised»

There is a strong invitation and a need of a culture and way of thinking shift towards holistic approaches and principles that can reconcile, rebuild links and relationships within our complex and interconnected systems.

“What we understand today as being ‘modern science’ is in fact not that modern, but was born nearly half a millennium ago at the time of the Renaissance in Europe. But even if we think of great Renaissance thinkers, such as Galileo Galilei, Leonardo da Vinci or Sir Isaac Newton, as the first ‘true scientists’, we should not forget that all civilizations throughout history have produced and accumulated knowledge to understand and explain the world, a process that was often accompanied or stimulated by technological development. Indeed, the explosion of knowledge during the Renaissance was sparked by a reawakened interest in the writings of Greek, Roman and Arab philosophers and scholars.”(Iaccarino, 2003)

Thus, since the Renaissance, Western/modern thinking and science have mainly been driven by classical logic and determinism, dominant positivist-reductionist paradigm and analysis. It seems important to me in this regard to speak about the complex thought developed by Edgar Morin, complex in the etymological sense of the term «complexus» meaning in Latin «embraced, to link» and which defines the systems in which we live as a complex adaptive system (CAS) interconnected. Since the Renaissance and in particular with influence of the Greek philosophers including Aristotle, modern science has been based on the laws of thought which have led to determinism. Since then, in Western science, it is accepted a priori that everything can be solved, can be determined, fully known and in a way that all is binary, linear, true or false, 0 or 1. It is our culture that since then has been built on that way of thinking. This determinism has led to artificially fragmenting into disciplines what we observe and study by coming to study phenomena by silo, separately. Today it is our whole society, our organizations which has adopted a fragmented logic and we have been realizing for some time that these fragmented logics do not allow the understanding of systems, even at a micro scale.

Prof. Fikret Berkes research presented “Western scientific knowledge is characterized by disembeddedness, universalism, individualism, nature/culture and subject/object dichotomy, mobility and an instrumental attitude (nature as commodity) toward nature”

But at the time of Aristotle, it was Plato who issued the postulate that beyond true or false (determinism) there is an infinity of possibilities (real numbers) between them and he thus invites us to consider all the possibilities, infinite, rather than one or the other. From fragmentation to determinism and simplism we move on to a ho-

listic, systemic approach and to complexity.

Prof. Levin from Princeton University sharing that “The notion of complex adaptive systems has found expression in everything from cells to societies. Much of our understanding of complex adaptive systems comes from observations of Nature. Today, we know that the scales of change are not so easily separable. The exact nature of those innovations cannot be predicted. Thus, the dynamics of the full system take place in a high-dimensional space whose axes are unknown. Because complex adaptive systems are systems in which microscopic interactions and evolutionary processes give rise to macroscopic phenomena through nonlinear interactions, these systems are subject to path dependence, with implications for the likelihood of multiple stable states and chaotic dynamics.”

This is quite important to understand the holism and complexity of our world and universe. From there, we can observe what I conceptualize as the circularity theory that can apply to all systems with 1 characteristic and 3 key principles:

- Characteristic of Complexity and Systemic property
- Principle of Permanent movement through Transformative Cycles towards Equilibrium state search: Complex Equilibrium
- Principle of Ongoing Learning process (Discovery space, Information expansion, resilience): Creating space for evolutive creation, innovation and discovery
- Principle of Cocreation, cooperation, participatory approach: Nurturing the Circle (circular cooperation)

We “are discovering, a universe that is dynamically alive: a whole system, fluid and interconnected. Science is discovering a new version of the “enchanted” world that was part of the natural mind for most of human history. This view is a radical departure from the static, mechanical, disembodied view of the world formulated by Descartes, Newton and other thinkers of the Age of Enlightenment which has dominated our thinking.” (Fikret Berkes)

## **Circular Economy**

I do believe that in order to change the paradigm around sustainability, a cultural shift is necessary to be able to imagine and implement new and alternative futures. In that perspective, circular economy might be a strong ally if the complexity thought and circularity principles that applied to all systems are fully integrated into its definition and implementation.

“Over the past decade, CE has attracted attention from policymakers, practitioners and researchers. It aims to interconnect the existing (a) production-related strategies, such as ecodesign, responsible production and responsible procurement, and (b) product and service optimization strategies, such as the sharing economy, maintenance and repair strategies, donating and reselling, performance (functiona-

lity) economy, reuse and redistribution, refurbishing, biochemical extraction, recycling and composting, and energy recovery.

On a more conceptual basis, CE is being promoted and has attracted attention based on the assumption that it has the potential to decouple human well-being and economic growth from the impacts created on life-supporting systems through an optimal use of resources.” (Raufflet)

This is the challenge today of the paradigm shift on the subject of the circular economy. On this subject, it is interesting to look at the scientific studies that have looked at the barriers to the development of the circular economy. Some of the most recent studies show that beyond barriers related to the market, regulations or technology, it is today cultural barriers that are identified as the greatest obstacle, emphasizing moreover that the subject of the circular economy, whose definition is still quite different in the literature and according to the actors who talk about it, is still a niche subject of discussion for the multi-sectoral experts who work on it, from local to global.

The circular economy must therefore, in a holistic and systemic approach, integrate all dimensions of sustainability (economic, technological, environmental, but also social, cultural and governance) in order to increase the interest and commitment of all stakeholders and to propose scenarios in line with the expected results, including in terms of social acceptance, social justice and behaviour change. The circular economy must therefore integrate the principle of complexity and be deeply rooted in interdisciplinary, intersectorial, intercultural logics. It thus calls for a qualitative and holistic approach in addition to quantitative indicators, thus associating with them, for example, the social, cultural and political dimensions that are important for Europe.

Thus, the holistic approach of the circular economy must not only make us aware of the need to accept and integrate the complexity of systems in implementations at all levels (micro, meso, macro) but also to further link it to the global challenges of sustainable development. Most of the approaches in Europe and Japan very centred on companies, technological development and institutional actors, with a still fragmented approach due to the silo structures at the academic level, companies and administrations do not yet fully integrate the holistic and systemic vision yet necessary if we really want a paradigm shift. The issue of actors’ responsibility is also at the heart of this paradigm. As Peace Nobel prize Amartya Sen wrote who invites us to have “a vision of mankind not as patients whose interests have to be looked after, but as agents who can do effective things—both individually and jointly”, responsible for the internal and external changes of our societies.

The question of the responsibility of all actors and at all scales is thus a major development on the path to a paradigm shift that the circular economy can represent.

### **Indigenous knowledge**

However, after being for such a long time in such culture and system thinking, it’s like if our modern societies might have difficulties in fully being able to imagine

what could be alternatives, innovations in the framework of holistic, circular and complex way of thinking.

“Little research exists on how alternative understandings of sustainability and societal well-being, such as those developed by marginalized Indigenous populations, can enrich and possibly challenge dominant visions of sustainability anchored in Western discourses.” (Velasco-Herrejon, Cambridge University - 2022)

Maurizio Iaccarino, Secretary General of the UNESCO World Conference on Science (in 2003 EMBO reports) was still sharing that «Traditional knowledge does not divide observations into different disciplines to the same extent as Western science, and this more synthetic and holistic approach may help to develop new paradigms for the observation and study of complex phenomena. The understanding of complex systems remains a major challenge for the future. As modern science is reaching its limits when attempting to explain the inner workings of the world around us, we should perhaps remember and re-evaluate the contributions of other cultures to the understanding of nature, as the Renaissance scientists did with the ancient knowledge of the Greek and Arab scholars.»

Long discredited, considered obsolete or even ridiculous, the international community is realizing more and more how much on these global issues, the inherently holistic approach of indigenous peoples makes it possible to respond to issues on which we have been advancing slowly for decades. The latest IPBES report highlights the very important contribution and interest of local and indigenous knowledge for biodiversity. Traditional ecological knowledge and practices have been so successful that although indigenous lands represent less than 22% of the world's land area, their traditional territories are home to around 80% of the world's biodiversity. This has led to a growing appreciation of the value of traditional ecological knowledge (TEK) in promoting sustainable land management and scientific discoveries and in providing environmental data to support climate adaptation strategies.

I remember in particular a meeting of a working group of the Arctic Council, at which I represented France, on the topic of the circular economy, where one of the representatives of indigenous peoples explained that the concept of circular economy was in practice in their communities forever, more like a way of life than a specific regulation.

### **What if we would try to apply these worldviews to our economy?**

I quite like this image taken by Walter Stahel to illustrate the economy, with the linear economy which is like a river, transforming natural resources into basic materials and products for sale.

The circular economy is more like a lake as an ecosystem (holistic approach) where everyone, every system who lives there works in symbiosis and where all internal and external systems are connected. There are not unique flows like a river but in-

side/outside processes that allow the system to remain in balance while integrating internal and external changes and transformations, with processes promoting resilience, reciprocity and respect between people and nature, for restorative and regenerative economies by design and which ultimately helps countries, cities and businesses reinvent progress.

### **What about GDP, growth, indicators?**

“Societal and economical wealth and well-being should be measured in stock instead of flow, in capital instead of sales. Growth then corresponds to a rise in the quality and quantity of all stocks — natural, cultural, human and manufactured.” (Stahel, 2016)

### **Circular Cooperation**

Edgar Morin recently said the “Complexity is a challenge to knowledge and especially to our disjunctive, reductive and linear way of knowing and requires a connective, integrative and dialogic way of knowing.”

Circular cooperation is a dynamic of reconciliation that embodies and brings to life complexity – complexus. A way to build a resilient society might be in learning from the others. Circular economy and cooperation could be one of the tool, from local to global, and global to local, from all disciplines and sectors, trying to acknowledge reciprocity and responsabilization, welcoming the other like she/he is, and co-creating a joint future of possibilities. As Claude Lévi-Strauss stated “There is no primitive nor advanced civilisations, there are only different answers to fundamental and identical issues”.

Following this idea it is important to observe that transformation and resilience are becoming concrete through real experimentation and not only theories. Dialogue with multidisciplinary, multisectorial and multicultural actors involved on a specific challenge is essential, with this intention for this dialogue to implement the principle of circular cooperation.

“Ways of knowing and ways of doing things mark traditional knowledge as process as opposed to knowledge as content. It is what Lévi-Strauss (1962) has called the science du concret, the native knowledge of the natural milieu firmly rooted in the reality of an accumulation of concrete, personal experiences, as opposed to book-learning. It is guided by “spirituality, ethical relationships, mutualism, reciprocity, respect, restraint, a focus on harmony, and acknowledgement of interdependence”. (Berkes, Chapter 1)

We will probably know more with Kari about Sitra’s and Finland’s both strategy and concrete implementations but this is definitely also a very interesting inspiration of how circular economy could be seen as precisely holistic based on empowerment of the actors from different sectors and investment in human resources (Sitra has funded since 2017 the development of circular economy education throughout the Finnish education system for around 4 million euros) with cooperation at the heart of all projects (for instance with support, coordination and the network of the 20 eco-industrial park).

**Conclusion :** From a circular economy to a circular society: a holistic approach towards a resilient and sustainable economy

Thus, holistic approaches and circularity principles can reconcile, rebuild links and relationships within our complex and interconnected systems, included our societies. In particular, connecting sustainability science to circular economy with an interdisciplinary, intersectorial, intercultural approach using the concept of circular cooperation may allow systems and societies to move from a linear to a circular economy with a broader and more inclusive view, towards a resilient society. And in that perspective, local, traditional and indigenous knowledge may be a great inspiration for our (Western) societies to acknowledge the principles of reciprocity and responsabilization between human and all their environments, and acknowledge that we need a culture shift that embrace and respect all approaches.

### **References:**

Global Sustainable Development Report 2019 « The Future is Now »: Science for Achieving Sustainable Development

Iaccarino Maurizio, 2003: Science and culture. EMBO Report, 4:220-223.

Levin Simon, 2002: Complex Adaptive Systems: Exploring the known, the unknown and the unknowable. Bulletin of the American Mathematical Society, Vol 4 #1, pages 3-19

Berkes Fikret, 2018: Sacred Ecology. Routledge

Raufflet Emmanuel et al, 2021: Intersections Between the Planetary Boundaries and the Circular Economy. Report Social Sciences and Humanities Research Council Canada

Stahel Walter, 2016 : Circular Economy. Nature, Vol. 531

Lévi-Strauss (1962) : La Pensée Sauvage

## **Panel discussion**

### **Kari Herlevi**

*Director, Circular Economy for Biodiversity –  
The Finnish Innovation Fund Sitra*

Kari Herlevi is Project director in the Circular economy for biodiversity focus area at the Finnish Innovation Fund Sitra. He is a multi-skilled circular economy expert. Before joining Sitra, Kari led the Green Growth programme at Tekes, which was associated with the circular economy and had a financing volume of more than 100 million euros. He also has experience of Silicon Valley, where he had the privilege of working with the best people in the field. Kari has master's degrees in finance and political sciences.



## **Kari Herlevi, Sitra, panel contribution**

Europe aims through the European Green Deal to create economies that are more resilient to different kinds of global threats – including the climate crisis, biodiversity loss and the overconsumption of natural resources. To solve the ecological problems of today, we must have a deep understanding of the structures that define how the world economy is operating. Currently, we are using far more resources than Earth can sustainably supply – 100 billion tons of raw materials annually, of which only 8.6% come from reused resources.

Companies have a crucial role in the transition, but it also provides them with enormous potential. In addition, investors also value companies that take the global crises seriously and are determined to find solutions. As the value chains of products and services are global, so must be the efforts to create more resilient systems.

The circular economy helps us to keep raw materials longer in use through maintenance, re-manufacturing, re-purposing or transforming them into entirely new product categories. And, of course, by designing out waste throughout the value chain. In addition to companies, we need various stakeholders, including policymakers, teachers, researchers and labour unions to be committed. It is essential that we have a shared vision of the future and a common understanding on how to get there. Sharing information on the benefits of circular economy solutions is crucial to motivate others to join the transition.

The Finnish Innovation Fund Sitra has worked for a long time to mainstream the circular economy. Just recently, Sitra published a new study that shows how we already have the solutions to halt global biodiversity loss right in front of us – in the circular economy. Through food redesign, by making products that last and by keeping products in active use for as long as possible, we get more value from what we have. This also reduces the need to extract virgin natural resources, leaving more room for nature to thrive.

The new study Tackling root causes – Halting biodiversity loss through the circular economy shows the significant potential of the circular economy. In the food and agriculture, construction, textiles and forest sectors, circular interventions can halt biodiversity loss even if no other action is taken. And more than that, the world's biodiversity can recover to the same levels as in the year 2000 by 2035, if the proposed circular interventions are implemented.

It seems evident that the circular economy offers tools to simultaneously address many of the most pressing ecological challenges of our time. Circular solutions should strive for being not only ecologically but also socially impactful. Leave no one behind is an important principle when we are pursuing system level change on a global scale. Everyone should feel committed to the common journey, and this requires mutually beneficial partnerships.

To promote the establishment of international partnerships around the circular economy, Sitra has organised the World Circular Economy Forum (WCEF) since



2017, in close collaboration with international organisations and countries. We are extremely happy that the WCEF has become a landmark event of the year, bringing together business leaders, policymakers and experts to present the world's best circular economy solutions.

This year, the Forum will – for the first time – take place on the African continent, as it is organised in Kigali, Rwanda and online. The forum will be hosted jointly by the Republic of Rwanda, the African Circular Economy Alliance (ACEA), the African Circular Economy Network (ACEN) and The Finnish Innovation Fund Sitra, with international partners. The forum will present some of the world's best circular economy solutions and examine how businesses from Africa and elsewhere can seize new opportunities and gain a competitive advantage in the transition to low-carbon and climate-resilient economies. It will explore major themes relevant to Africa's development in which circularity could play a big role, such as climate and nature, youth, infrastructure, entrepreneurship and innovation, as well as trade and value chains.

One practical example of policy level work to promote circularity is the world's first national circular economy road map, which was created in Finland under Sitra's lead in 2016. Now, just a few years later, the circular economy is taught at all levels of education throughout Finland, and every school year more than 70,000 children and young people learn about the principles of a circular economy.

To make things easier for other countries, Sitra has published a guidebook which shares Finland's learnings, including the challenges faced, and walks you through the different steps of how the road map was made, if you are interested in how you can succeed in the circular economy.

Recently, Finland has established a cross-sectoral Strategic Programme to advance the circular economy, and the concept of a circular economy is being translated into actions embedded in more and more organisations' work plans on different levels. Distinct about this programme is that it sets targets related to material consumption: primary raw material consumption in 2035 will not exceed that in 2015; the productivity of resources shall double during the same period, and the circular material use rate CMU will also double by 2035.

To conclude, Finland's journey towards the circular economy needs continuous efforts in coming years in all sectors to make these plans turn into reality and to truly decrease waste generation in a significant manner. This is not possible without international partnerships and strong collaboration with leading countries such as France in the European context.

# Susanna Lehvävirta

Research Director, Helsinki Institute of Sustainability Science  
University of Helsinki



Susanna Lehvävirta is the Director of Helsinki Institute of Sustainability Science (HELSUS). She is an interdisciplinary scholar, versatile researcher and project director.

She runs research projects concerning urban nature, socio-ecological systems related to it, and nature conservation under climate change. Her background is in plant ecology, but during her career she has developed a more holistic understanding and a way of thinking, which is demonstrated in her research on a wide range of topics, including ecology, environmental aesthetics, user perspectives, recreational psychology, jurisprudential perspectives, life cycle analyses, economy, geography and philosophy. She has led several research projects, which have combined urban nature perspectives with human point-of-view, as well as nature protection with climate change research. The Helsinki Institute of Sustainability Science participates in accelerating sustainability transformation in the society and advancing the transition to more sustainable solutions through inter- and multidisciplinary research and education. At its centre lies dialogue and cooperation with different actors in the society.

## Circular economy - truly sustainable?

In all sustainability transitions, honestly, deeply and completely sustainable solutions are needed. Otherwise, a solution in one place may lead to unsustainable or unfair material extraction and pollution elsewhere. In concrete terms, any investment in circular economy should consider all possible risks to the biosphere, from material extraction to transport, construction, production and to the end-of-life treatment. Thus, circular economy solutions, like all other sustainability-targeted solutions, need to take into account the various dimensions of sustainability (ecological and human), and respect the limits set by the different spheres of sustainability (Fig. 1, Rupprecht et al. 2020). To really be successful solutions to global problems, solutions of circular economy need to be evaluated from the perspective of both local and global impacts, using the multispecies sustainability approach. If we fail to do this, then we are just re-locating environmental and ethical problems and ignoring the global impacts.

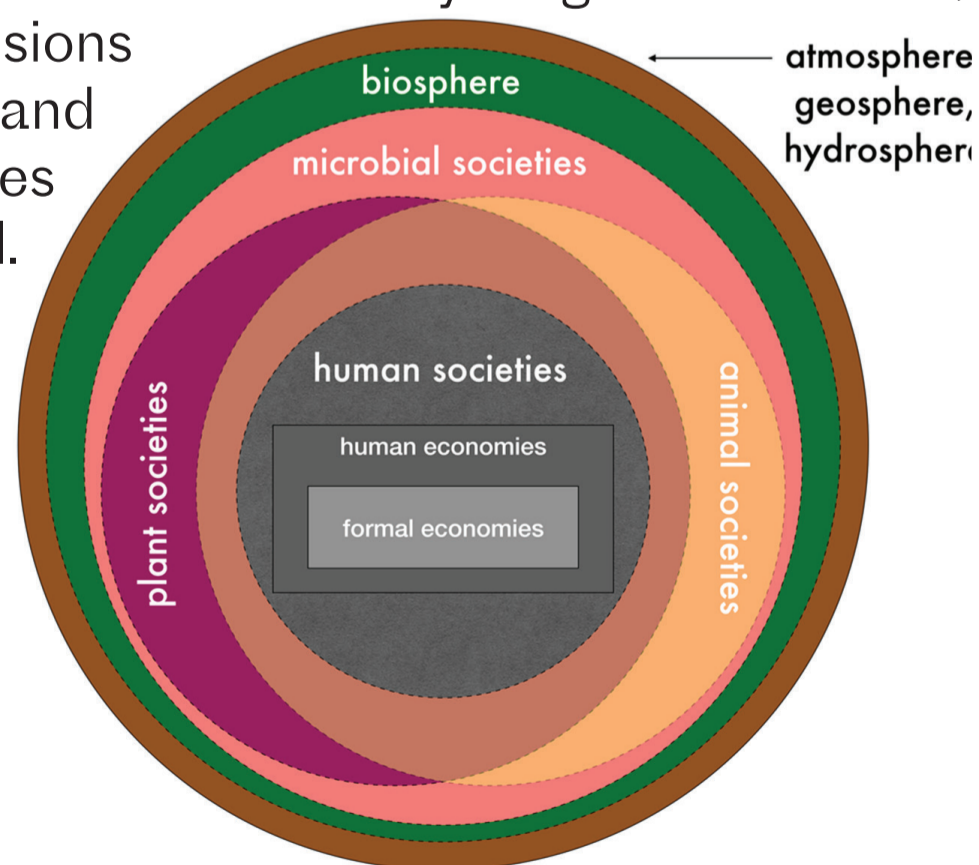


Figure 1. Copied from the original Open access journal article by Rupprecht et al. 2020: Visualisation of multispecies sustainability emphasizing systems view and interdependencies. Elements depend on those that embrace them and have impacts on the outer ones.

Furthermore, circular economy, together with longer-term use of goods and infrastructure, needs to be considered at all levels and sectors of the society. For example, the most sustainable building is the one that does not get demolished but becomes renovated or re-used; the most sustainable goods are the ones that last long and do not lose their value, i.e. are wanted even after several years of use. We need to slow down consumption, and for this to happen at all levels and among all actors of the society, we need re-conceptualisation of what is good, attractive, wanted, sensible or, simply, doable. We need to rethink e.g. food, packaging, fashion, buildings, materials, style, aesthetics, value and values. We need more capacity in mending and repair. We need trendsetters and social media influencers. We need brave start-ups and visionary and agile senior entrepreneurs.

To achieve all this, we also need strong regulation, from global to local. Examples may include e.g. global agreements that enhance circular economy within the framework of multispecies sustainability, as well as national coercive regulation and incentives that encourage fast transitions. We also need investment in interdisciplinary sustainability education and research. Only by involving interdisciplinary research, e.g. via co-creation of circular economy solutions, can we strive towards honestly, deeply and completely sustainable transitions.

While a lot more needs to be done and fast, there are also initiatives that create hope. There are movements that give value to repair and reuse, one example being “visible mending” that creates fashion conveying a strong message via showing how old clothes can be turned into fancy outfits. There are wastefood and zero-waste restaurants, there are architects who create modern facilities from old buildings and sometimes even from ruins, and many industrial level circular economy solutions. There are platforms for sharing and companies that connect producers of waste with those who can use the waste as material. There are even emerging startups that quantify the total positive and negative net impacts of companies! Yet, while these kinds of initiatives are inspiring, they do not suffice to solve the global environmental crisis. Not unless they become the prevailing way of thinking. And not unless we manage to weigh all the pros and cons of all our plans, development pathways and solutions. In terms of circular economy, critical considerations may involve, e.g., whether a new solution could create unwanted impacts via catalysing specific behavior that causes environmental costs, or via pollution to the environment, or via raw material extraction for the circular economy infrastructure and technologies.

Systems thinking is the key to understand our world not as parts but as an innumerable amount of connections. Via understanding our world as connections we will be better able to weigh the consequences of each decision we take. Systems thinking needs to be strongly included in all curricula of the humankind, from kindergartens onwards. Societies need to invest in capacity to build complex models to foresee risks and unwanted impacts at different scales, and to evaluate the impacts of production, transport, use phase and end-of-life treatment. We

also need to invest in better imaginative capacity. While we are always to some degree defined by the past and the present, we need to be able to dream. In order to build better futures, we need to be able to imagine such.

Reference:

Christoph D. D. Rupperecht, Joost Vervoort, Chris Berthelsen, Astrid Mangnus, Natalie Osborne, Kyle Thompson, Andrea Y. F. Urushima, Maya Kóvskaya, Maximilian Spiegelberg, Silvio Cristiano, Jay Springett, Benedikt Marschütz, Emily J. Flies, Steven R. McGreevy, Layna Droz, Martin F. Breed, Jingchao Gan, Rika Shinkai and Ayako Kawai, 2020 . Multispecies sustainability. *Global Sustainability*, Volume 3, 2020 , e34. DOI: <https://doi.org/10.1017/sus.2020.28>. Open Access article, distributed under the terms of the Creative Commons Attribution licence/, which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited (<http://creativecommons.org/licenses/by/4.0>).

## Anne Kaiser

*Sustainability Manager – Saint-Gobain Finland Oy*

Anne Kaiser is the Sustainability Manager of Saint-Gobain in Finland and Sustainability Coordinator for Saint-Gobain in Nordic and Baltic region. Anne is an experienced marketing and sustainability professional, holding a Master's Degree in both fields. Anne has worked in different sustainability management and consulting, marketing, R&D and sales positions in multi-national companies (Saint-Gobain, Ruukki, Ramboll). Anne focuses on creating awareness of real estate and construction industry's crucial role on mitigating climate change as well as circularity potential within built environment. She has gathered an extensive knowledge about built environment's sustainability potential over the construction value chain. Anne is a Chairperson of the board of Green Building Council Finland and Coordinator of EU-funded H2020 circular economy innovation project WOOL2LOOP.



### • Anne Kaiser, Sustainability Manager – Saint-Gobain Finland Oy

#### **The circular economy is about joint collaboration, ecosystems and a new way of thinking**

Saint-Gobain is global company with activities in 75 countries and more than 165,000 of employees. We have about 800 manufacturing facilities and over 80% of our turnover comes the from the built environment.

When it comes to the circular economy, the biggest challenge is to meet the growing need with less carbon and resources. Our solutions play in a critical role in addressing these challenges.

#### **A part of the problem and the solution**

The building environment and its resources are both the problem and the solution when it comes to sustainability. When building something new, the construction has to be

implemented in a way that uses the valuable resources wisely and also uses less carbon in the process.

As a global material manufacturer Saint-Gobain is very keen to maximize the use of recycled and re-used materials. The circular economy and the sustainable use of natural resources actually helps to lower the carbon impact of the company's operations, products and the buildings.

### **Know your own impact**

Saint-Gobain Finland is committed to be carbon neutral by 2035. In order to reach our goal, we have to operate in a sustainable way and also find new ways of operating and collaborating together with our customers and partners.

We know our climate impact very well, most of our emissions come from raw materials. To tackle this issue, we study, test and use alternative raw materials that can replace the use of virgin or emission-intensive materials, such as recycled glass or gypsum. Here, the circular economy offers a solution to minimize our carbon emissions.

However, you cannot avoid waste altogether in production and therefore we try to find new ways to recycle or use materials in such a way that no waste actually goes to waste.

### **Ecosystems and collaboration**

One way to develop, test and use alternative and even new raw materials is to actively take part in the circular economy research and innovation projects.

We for example coordinate an EU funded WOOL2LOOP innovation project that aims to divert mineral wool waste from landfilling and develop its utilization into novel products, while securing the access to sustainable and non-conventional raw materials for the construction industry in the future.

We are also a part of the EU funded Horizon 2020 project called VIOBOND that aims replace refined petroleum products, phenol, and formaldehyde in resins with industrially produced renewable lignin, i.e., the use of bio-based, more environmentally friendly, and less toxic materials in the production of furniture, floor surfaces, thermal insulation, sandpaper and other everyday products.

We actively seek for partners and projects that suit our sustainability action plan, as we truly believe that through these joint ecosystems and close collaboration all parties can achieve better results.

### **New way of thinking**

Change does not happen overnight. A sustainable way of working also requires a new way of thinking.

To be sustainable, organizations should no longer work or collaborate in the traditional way. Instead, organizations should collaborate closely together with their customers and partners. We are all aiming for the same targets and no one can reach them alone. Internal ways of working should be further developed to always critically assess solutions and decisions and to consider all of the options available instead of choosing that one that's the easiest and most familiar.

# Mira Jarkko

*Project manager, Cluster programme for Circular Economy  
City of Helsinki*



Mira Jarkko is (an expert on climate mitigation, circular economy and) the project manager for the Cluster program for Circular economy in the City of Helsinki. The Cluster enables new innovations and business opportunities in circular economy, especially in the building sector. There are currently about 80 businesses and organizations in the Cluster. City provided resources work as the main testbed, but privately owned property can also act as a platform for piloting new solutions through cluster-enabled cooperation.

## **The path to circular construction in the City of Helsinki**

The City of Helsinki has set itself the ambitious target to be a forerunner in climate change mitigation. In practice, this means becoming carbon neutral by 2030 and generating zero carbon emissions by 2040. In order to achieve this a Roadmap for Circular and Sharing Economy has been created with the aim to encourage repair and reuse on the one hand, and reduce lifecycle emissions on the other, thereby providing employment. The Roadmap covers four domains: construction, procurement, green waste and sharing economy. In order to accelerate the circular transition within the City's construction sector, the Circular Economy Cluster Program was founded within the Department of Economic Development, Innovations and New Experiments. The 3-year Program is funded by the City with 3 million euros. The Program supports and executes several activities with its cooperation partners, such as promoting circular design in construction, developing and commissioning new (digital) solutions, e.g. new models and pilots for demolition processes, making use of existing data, organizing innovation competitions, as well as enabling and advancing the reuse and repurposing of construction elements.

## **Why construction?**

The Ministry of the Environment estimates that approximately 1.6 million tonnes of construction and demolition waste is generated every year in Finland. According to the EU's directive on waste, 70% of this should be reused, but it is estimated that the national figure stands at only ca. 50%. This serves as a good reason to promote circular economy in the sector, while conserving natural resources, slowing down climate change and loss of biodiversity provide further arguments. Enabling innovations and creating business opportunities are also high on the agenda. Since the density of construction actors and activities is constantly growing, Helsinki shows great potential for supply and demand to meet and new solutions to be found. Moreover, since the City of Helsinki operates in the local construction ecosystem as a client, developer, and a constructor, it possesses the competence to influence and demand circular construction.

## **Collaboration at the heart of all operation**

The purpose of the Cluster Program is to provide a development platform with public and private construction projects and sites. It invites stakeholders to join the discussion

on a neutral ground and provides the participants a carefully listening ear on their needs and desires, thereby seeking synergies among the actors. Altogether over 80 companies and organizations have joined, including construction and real estate stakeholders, material and element providers, designers and architects, construction and infrastructure consultancies, recycling operators, digital solutions providers, as well as universities and research institutes. It is the diversity of participants that enable the ecosystem to advance circular economy in the local construction sector – everyone is needed.

Since the provided opportunities for participation in the Cluster Program are flexible and there is great demand for information and peer learning, actors have been eager to join the ecosystem created by the Program. Overall, the feedback received from the participants has been very positive. Many appreciate the concreteness, illustrated by the several cases that the Program is involved in, as well as the possibility for a range of professionals to join – not just those in charge of the company's sustainability. Besides, several participants have discovered the opportunities to develop and test ideas and products, for example circular construction materials.

### **Focus on concrete examples and action**

Before the start of the Program, potential participants were interviewed, so the most critical topics were found out. Concreteness and actions on the field were highlighted as important means for the actors to move forward. One such an example of concrete measures is the Vattuniemi pilot that considers how circular economy can be applied to an extensive construction project with a number of players and vast material flows.

Vattuniemi is situated in Lauttasaari, in western part of the City and it involves an area of 16 old, privately owned, mainly office buildings. Since it is infeasible to convert them into housing, the buildings have come to the end of their life cycle. The Cluster brought the operators of the area together in order to promote circular economy principles in Vattuniemi's construction and demolition. The project provides a platform for setting circular construction goals, sharing information, sparring, and piloting the reuse of construction materials, among others. At the beginning of the project, predemolition audits were provided by the demolition operators and the collected data was published on a platform open to all actors in the ecosystem prior to the demolition. The aim here was to help plan and design new buildings from the identified deconstruction materials and elements as well as to pass them on to suitable operators and help pieces to find reuse beyond the project area.

Besides being involved in construction and demolition projects, the Cluster Program has arranged several seminars and discussion panels to provide actors opportunities to learn from different fields and each other. In September, it will, together with the Ministry of the Environment, invite architects and other planning professionals for a two-day innovation camp. Here the participants will learn from the top circular economy experts and co-create new approaches for designing and reusing construction elements and materials. It further provides the participants an opportunity to network with a range of actors and exchange on the impact of circular economy principles on the design and planning process – to enable the circular leap.

More information on the Cluster Program can be found [here](#), information on Vattuniemi is linked [here](#) and on Reimagine Buildings -conference [here](#), only in Finnish.

# Saara Alakorva

*Researcher - University of Lapland*

Saara Alakorva is a doctoral candidate and university teacher at the University of Lapland, Faculty of Social Sciences. In her PhD research, Alakorva is interested in Sámi political history and contemporary Sámi political thinking. As a Sámi scholar herself, Alakorva has deep knowledge of issues of the modern Sámi society and she has a background in Sámi reindeer herding. She is co-editor of *The Sámi World* (Routledge, 2022).



# Teemu Loikkanen

*Researcher - University of Lapland*

Teemu Loikkanen is a PhD student in sociology and junior researcher at the University of Lapland, Faculty of Social Sciences.

In his research he has examined Circular Economy, especially in relation to waste infrastructures and various types of waste. Particularly he is focused on the position of individuals in CE and has examined it by developing the concept of waste citizenship.



## • Saara Alakorva and Teemu Loikkanen, Researchers - University of Lapland Circularity in the Sámi nature-based livelihoods. What could EU's circular economy policy learn from the Indigenous and local perspectives.

Saara Alakorva and Teemu Loikkanen are doctoral researchers at the University of Lapland. They both have worked in the Interreg Nord funded “Dialogues and Encounters in the Arctic” project in the work package led by Sanna Valkonen, Professor in Sámi Studies, at the Faculty of Social Sciences of the University of Lapland. In the present project, Alakorva and Loikkanen examine Circular Economy (CE) from the Sámi perspective with a particular focus on traditional Sámi reindeer herding.

Reindeer herding has many ecologically sustainable aspects. This is evident in the livelihood's commitment to principles such as the necessity to live in respect and consideration of the animal's natural behaviour, including not keeping the animal in captivity. In addition, reindeer herding has been viewed as climate friendly in that grazing by reindeer prevents shrubification of fell areas and decreases net thermal radiation. Then again, other competing land use forms have caused pressure to reindeer herding to adapt to various changes, which, in turn, has led to a situation in which reindeer herders can no longer independently determine the way they lead their life and practice their livelihood. Sometimes reindeer need



supplementary forage when nutrition in natural grazing areas is scarce or not accessible due to weather conditions, e.g. a thick snow cover.

Reindeer herding is considered a particularly Sámi livelihood and way of life. The task of the herder of freely grazing reindeer is to follow the reindeer and take care of them. Free grazing is one of the defining characteristics of Sámi reindeer herding. The reindeer has a particular significance to the Sámi who are living with and from the reindeer, and Sámi life obeys the rhythm of the reindeer. Although reindeer herding as a livelihood has conformed to the rules and models of the market economy, and innovations – such as motor vehicles and other aids – have been adopted to facilitate herding work, the foundations of the livelihood have remained unchanged. In many ways, reindeer herding continues to be a way of life that persists despite the fact that it can be challenging for its practitioners to make a living from it. Despite the economic hardships, reindeer herders seem to value the reindeer and the way of life associated with it more than monetary affluence.

The Sámi have traditionally maximised the use of every part of the reindeer. All edible parts of the animal have been consumed for nutrition. Versatile reindeer dishes and other natural products such as blood sausages in a natural casing, reindeer blood dumplings (kumpus), a soup made of reindeer hooves, and the tongue, liver and heart boiled or dried form the foundation of the traditional Sámi food culture. Moreover, reindeer herding dogs – the reindeer herder's companions – must have their nutritional requirements met.

Other materials derived from the body of the reindeer, such as hide, antlers, bones, and the nail of the hoof, have been used as raw materials for utility objects and clothing. Over millennia, the Sámi have accumulated and developed their ways of knowing that have been critical for survival in the arctic conditions. These ways of knowing have given rise to the Sámi duodji tradition – a rich handicraft tradition which continues to be actively practiced today. For example, reindeer hides are processed into soft leather with the aid of natural materials only.

Given the above, it is well justified to draw a parallel between the traditional Sámi way of life and some of the principles of CE. From the perspective of CE, using all the parts of the animal in meat production as well as producing the meat in the most ethical and environmentally beneficial way is of great importance. Traditionally, the use of every part of the reindeer has been maximized and, thus, the process has generated practically no waste. Over the past few decades, a more complete transition to a monetary economy has shifted the emphasis of reindeer herding towards meat production. Consequently, this has affected the conception of what kind of a herd is profitable for the herder and worth maintaining. While previously the practice had been to slaughter older animals – often those that can no longer produce offspring – these days, less than one-year old calves can be slaughtered.

For instance, Finland's membership in the European Union in 1995 significantly transformed the practices of skinning reindeer and also reduced the opportunities to commercially benefit from parts of the body of the reindeer, other than the meat. Formulated from the perspective of agriculture, the European Union's statutes governing the slaughter of livestock animals were extended to cover reindeer herding. The Nordic countries, including Finland, share a culture of meticulous adherence to statutes, which led to a situation in which selling reindeer that had been slaughtered in the field in subzero temperatures – a practice that is generally considered hygienic – became increasingly difficult and, finally, slaughtering of reindeer was moved almost entirely indoors to facilities that met the requirements of the directive. In a slaughterhouse setting, the effective transfer of the best parts of the body of the reindeer from the slaughterhouse to the market determines the skinning practices. Thus, there is no time for removing the reindeer hide in such a way that would make it possible to keep the animal's legs to be used as handicraft materials. This has made it increasingly difficult to obtain enough material for traditional handicrafts, which, in turn, threatens the continuity of traditional knowledge related to handicraft making. Reindeer herders may continue skinning reindeer in the traditional way for their own family's use. The danger, however, remains that this is not enough to maintain all the traditions and the related knowledge and skills.

Previously, the general practice was to skin reindeer somewhere near the reindeer fence, where local customers came to purchase the entire animal, including blood. Now that reindeer skinning practice has been moved to slaughterhouses, in most of them it is no longer possible to collect the blood of the animal. What has not been considered are the special characteristics of the setting: In Arctic environments, the conditions in which traditional reindeer skinning takes place may be more hygienic than those in warmer locations. The changes in skinning practices have already brought about a reduction in the local clientele, as the number of people with the necessary knowledge and skills for using different parts of the reindeer for nutrition is decreasing. The new generation customers can no longer use or prepare food from some reindeer parts, such as the heart or liver, or make blood sausages. In slaughterhouses, large quantities of edible material go to waste.

Viewed from the perspective of CE – which aims at retaining materials in its cycle and minimizing waste generation – this practice is clearly problematic. The new generation customers would be interested in purchasing hot-smoked meat prepared outdoors at a *lávvu* (*lávvu*-smoked meat), or reindeer meat dried outdoors in the early spring sun (air-dried meat). However, the EU regulations have made selling such meat products practically impossible, which also restricts opportunities for meat processing that would bring more profit to the primary producer. The infrastructure and energy requirements of the traditional meat processing methods, such as airdrying and *lávvu*-smoking, are clearly lower than those of the facilities for producing other further processed products, some of

which have undergone several processing stages. Thus, it can be argued that maintaining the traditional meat processing methods could be beneficial from the perspective of the EU's CE objectives.

The EU's CE objectives also concern Sámi and reindeer herding. It is thus worth considering the way of delivering the idea of CE to the local inhabitants. Bearing in mind that the previous EU directives introduced in Sámi have made it more difficult for reindeer herders to live according to the principles of CE, we must ask whether the directives and projects – which represent the implementation of the EU's CE objectives – should be framed as new ideas and objectives for the locals. If, from the local perspective, the EU's CE policy is perceived merely as something dictated from above, this may negatively influence the attitude climate and the willingness of the local inhabitants to be part of CE. A more effective approach may be to frame the EU's CE as something that supports existing CE practices of the local community and offers opportunities for maintaining and revitalizing these practices as well as rendering them more effective. It seems clear that the focus of the EU's CE cannot be on innovation alone, but consideration should also be given to existing practices based on the idea of versatile use and recycling of materials that have been developed in the course of centuries.

Instead of introducing yet new statutes in the name of the EU's CE policy, it may be necessary to deregulate some of the existing statutes which currently constitute a hindrance to ecological and sustainable modes of operation that are based on the cycle of nature and support continuity of traditional knowledge. This would require taking regional and cultural differences into consideration instead of offering the same solutions to all. One example of local implementation of the EU's CE policy could be to enable selling of hot-smoked and air-dried reindeer meat by means of deregulation of statutes or by redefining the statutes' scope of coverage. Acceptance by locals and assessment of the social impact of CE must be taken into consideration in order to be able to secure a fair transition to CE, which receives broad support from citizens. In addition, in the transition to CE, attention must be paid to conducting local assessment of the ecological impacts and securing use and continuity of traditional knowledge. The traditional Sámi reindeer herding serves as a good example that can help illuminate the specificities of other European contexts from the CE perspective and provide ideas for their successful transition to CE.

# Petrus Kautto

*Director, Programme for Sustainable Circular Economy  
Finnish Environment Institute Syke*



Dr. Petrus Kautto is Director for SYKE's Programme for Sustainable Circular Economy. He has extensive track record of generating policy advice and operation at the science-policy interface including working group for the Government strategic programme to promote the CE. Kautto holds a PhD from Aalto University School of Business and has more than 20 years research experience in the fields of circular economy, business and politics, regulation and policy analysis and appraisal.

## **• Petrus Kautto, Director, Programme for Sustainable Circular Economy, Finnish Environment Institute Syke How we advance the transition to a sustainable circular economy and bioeconomy - selected highlights**

Both France and Finland have aimed to be forerunners in the transition towards the Circular Economy. While France is known for pioneering novel regulatory approaches, such as ecomodulation, the right to repair, and availability of spare parts (LOI n° 2020-105 2020; Dalhammar et al. 2020; Kautto et al. 2021), Finland was the first country to adopt a national CE roadmap (Sitra 2016). In 2021, the Finnish Government approved an ambitious CE vision, according to which 'a carbon-neutral circular economy is the foundation of our successful economy' by 2035 (Finnish Government 2021).

Currently, the first steps are taken to implement the Strategic programme and its targets. The Finnish Environment Institute is participating to this work in several ways. Firstly, by conducting material flow analysis and scenario work on the use of natural resources in close collaboration with Geological Survey of Finland, Natural Resources Institute Finland, VTT Technical Research Centre of Finland, and Statistics Finland. This analysis will provide information on CE measures and their impact on resource use, the environment and the economy and form a basis for voluntary agreements with companies and municipalities. Secondly, by coordinating (with Motiva) National network to support the work of ecosystems in promoting a circular society. This network will be launched in September 2022. Closely connected to this implementation process and more generally to policy instrumentation for CE is work related to rapidly changing regulation for CE. Proposals for novel policy instruments and renewal of regulatory environment both nationally and within the European Union creates increasing need for high quality policy appraisals, both ex ante and ex post. Existing regulation is mainly constructed to enhance linear economy and its safety, and many attempts are

ongoing to renew regulatory frame to boost circularity. Only in the EU's Circular Economy Action Plan (CEAP) more than 30 policy measures were proposed by the Commission (2020). While this renewal is necessary for increasing circularity, all these measures need to be assessed keeping in mind that circular is not always sustainable. Besides, when renewing regulation so rapidly, it is important to acknowledge policy coherence – incentives to be created should be as clear and parallel as possible (Kautto et al. 2021, 140-141). Coherence should also be pursued with other rapidly changing policy areas, such as ones related to data (Kauppila et al. 2022). Finally, detailed regulation and increasing knowledge production requirements might easily cause regulatory burden problematic particularly for small and innovative companies.

Finally, all our activities and assessments are based on ambitious research. Important recent examples include (but are not limited to)

- research on economisation as a co-evolutionary process between modes of valuation, public policy measures and market (re)formation (Lazarevic and Valve 2020; Valve et al. 2021),
- study on the social impacts of the circular economy and how to measure them (Pitkänen et al. 2020; Myllymaa et al. 2021), and
- one of the first scientific papers on how to halt biodiversity loss through the circular economy (Ruokamo et al. 2022).

European Commission. 2020. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan. For a cleaner and more competitive Europe. COM(2020) 98 final.

Kauppila, T. (ed.) 2022. Handbook for a Data-Driven Circular Economy in Finland: Data Sources, Tools, and Governance for Circular Design. Espoo: VTT. VTT Technology 401.

Kautto, P., Kalimo, H., Salo, H., Heinonen, T., Lifset, R., Mateo, E., Nissinen, A., Leskinen, P., Miettinen, M., Turunen, T., Jukka, A. 2021. The Circular Economy and product policy. Helsinki: Prime Minister's Office. Publications of the Government's analysis, assessment and research activities 2021:47.

Lazarevic, D., Valve, H. 2020. Niche politics: Biogas, technological flexibility and the economisation of resource recovery. Environmental Innovation and Societal Transitions, Vol. 35, June 2020, pp. 45-59.

Myllymaa, T. et al. 2021. Executing circular economy strategies in practice in Finland. Results and experiences from Circwaste project. Helsinki: Finnish Environment Institute. Reports of the Finnish Environment Institute 19/2021.

Pitkänen, K., Karppinen, T., Kautto, P., Turunen, S., Judl, J. and Myllymaa, T. 2020. Sex, drugs and circular economy. What are the social impacts of CE and how to measure them? In Brandão, M., Lazarevic, D., Finnveden, G. (eds.): Handbook of the Circular Economy. Cheltenham: Edward Elgar Publishing Ltd, pp. 162-175.

Ruokamo, E., Savolainen, H., Seppälä, J., Sironen, S., Räisänen, M., Auvinen, A.-P. 2022. Exploring the Potential of Circular Economy to Mitigate Pressures

on Biodiversity (February 28, 2022). Available at SSRN: <https://ssrn.com/abstract=4046676> or <http://dx.doi.org/10.2139/ssrn.4046676>.

Valve, H., Lazarevic, D., Humalisto, N. 2021. When the circular economy diverges: The co-evolution of biogas business models and material circuits in Finland. *Ecological Economics*, Vol. 185, 2021, 107025.

## Johanna Kohl

*Director, Circular Bioeconomy Research Programme  
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Johanna Kohl (Adjunct Professor, Dr. Soc.Sc) works as Director of the Circular Bioeconomy Research Programme in Natural Resources Institute Finland (Luke). She leads the research project portfolio and future developments of optimized material cycles, added value and new products from main and side streams and transition towards circular bioeconomy.

Kohl has over 20 years of experience on national and international strategic foresight. She is strongly connected with Circular Bioeconomy Alliance. She is also involved in the current Horizon Europe National Expert Group on Cluster 6 (incl Circular Economy). Member of the Uusimaa region council on research. Kohl is an active member on Circular Economy Innovation Ecosystem (Finnish RTOs), and also a member of the National Circular Economy Strategic Programme Implementation multi-stakeholder committee lead by the Ministry of Environment.



**Moderation: Johanna Kohl, Director, Circular Bioeconomy Research Programme - Natural Resources Institute Finland Luke**

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